may further include a plurality of radio interfaces **840** coupled to the antenna **820**. The radio interfaces may correspond one or more of the following: Long Term Evolution (LTE, or E-UTRAN), Third Generation (3G, UTRAN, or high speed packet access (HSPA)), Global System for Mobile communications (GSM), wireless local area network (WLAN) technology, such as for example 802.11 WiFi and/or the like, Bluetooth, Bluetooth low energy (BT-LE), near field communications (NFC), and any other radio technologies. The radio interface **840** may further include other components, such as for example filters, converters (for example, digital-to-analog converters and the like), mappers, a Fast Fourier Transform (FFT) module, and the like, to generate symbols for a transmission via one or more downlinks and to receive symbols (for example, via an uplink).

[0067] In some example embodiments, the radio interface **840** may include a radio having the tunable RF filter **100** and/or **400** disclosed herein.

[0068] The network node **800** may further include one or more processors, such as for example processor **830**, for controlling the network node **800** and for accessing and executing program code stored in memory **835**. In some example embodiments, memory **835** includes code, which when executed by at least one processor causes one or more of the operations described herein with respect to network node, such as for example a base station, access point, and the like. For example, network node **800** including tunable RF filter **100** and/or **400** may perform the processes disclosed herein with respect to tunable RF filter **100** and/or **400** (see, for example, process **600** and the like).

[0069] Some of the embodiments disclosed herein may be implemented in software, hardware, application logic, or a combination of software, hardware, and application logic. The software, application logic, and/or hardware may reside on memory **40**, the control apparatus **20**, or electronic components, for example. In some example embodiment, the application logic, software or an instruction set is maintained on any one of various conventional computer-readable media. In the context of this document, a "computer-readable medium" may be any non-transitory media that can contain, store, communicate, propagate or transport the instructions for use by or in connection with an instruction execution system, apparatus, or device, such as a computer or data processor circuitry, with examples depicted at FIGS. **7** and **8**. A computer-readable medium may comprise a non-transitory computer-readable storage medium that may be any media that can contain or store the instructions for use by or in connection with an instruction execution system, apparatus, or device, such as a computer. In addition, some of the embodiments disclosed herein include computer programs configured to cause methods as disclosed herein.

[0070] Without in any way limiting the scope, interpretation, or application of the claims appearing below, a technical effect of one or more of the example embodiments disclosed herein is a tracking filter that can be used in cellular systems. Without in any way limiting the scope, interpretation, or application of the claims appearing below, another technical effect of one or more of the example embodiments disclosed herein is a lower power consumption of the filter **100** and/or **400** due to the passive framework of the filters **100** and/**400**, when compared to more active filter frameworks.

[0071] Although some of the examples described herein refer to filters **100** and **400** being used in a receiver, the filters **150** and **400** may be used in other applications including low frequency applications as well. For example, the filters **100** and **400** may be used in a transmitter front-end as well. In the case of a transmitter, the notch may be placed at a frequency where a maximum noise suppression is desired (which is usually in a receive-band).

[0072] Although some of the examples disclosed herein provide specific values and simulated results such a magnitude and frequency responses, these values and results serve only as examples as other values and results may be realized as well.

[0073] If desired, the different functions discussed herein may be performed in a different order and/or concurrently with each other. Furthermore, if desired, one or more of the above-described functions may be optional or may be combined. Although various aspects of the invention are set out in the independent claims, other aspects of the invention comprise other combinations of features from the described embodiments and/or the dependent claims with the features of the independent claims, and not solely the combinations explicitly set out in the claims. It is also noted herein that while the above describes example embodiments, these descriptions should not be viewed in a limiting sense. Rather, there are several variations and modifications that may be made without departing from the scope of the present invention as defined in the appended claims. Other embodiments may be within the scope of the following claims. The term "based on" includes "based on at least."

What is claimed:

1. An apparatus comprising:

a bandpass filter comprising a resistive-capacitive configuration of N-path filters tunable to a first center frequency based on at least a first clock frequency;

a notch filter comprising a capacitive-resistive configuration of N-path filters tunable to a second center frequency based on at least a second clock frequency; and

a combiner coupled to the bandpass filter and the notch filter to combine a bandpass output signal provided by the bandpass filter and a notch output signal provided by the notch filter, wherein the combiner outputs a combined output.

2. The apparatus of claim **1** further comprising:

a splitter coupled to the bandpass filter and the notch filter, wherein the splitter provides a differential signal to an input of the notch filter and the bandpath filter.

3. The apparatus of claim **2**, wherein the splitter comprises a balun.

4. The apparatus of claim **1**, wherein the combiner comprises a differential difference amplifier.

5. The apparatus of claim **1** further comprising:

a clock to tune at least one of the first center frequency and the second center frequency by at least varying a frequency of at least one of the first clock and the second clock.

6. The apparatus of claim **1**, wherein the first clock frequency and the second clock frequency are the same frequency.

7. The apparatus of claim **1**, wherein the resistive-capacitive configuration of N-path filters comprises one or more transistors coupled to one or more capacitors.

8. The apparatus of claim **1**, wherein the first center frequency comprises a center of a pass band of the bandpass filter.